

CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

1 1. A waveguide comprising:
2 a waveguide core, and
3 an air-gap cladding engaging a portion of the waveguide core.

1 2. The waveguide of claim 1, wherein the waveguide core includes at least one
2 coupling element.

1 3. The waveguide of claim 1, further comprising:
2 at least one coupling element disposed adjacent to the waveguide core.

1 4. The waveguide of claim 1, further comprising:
2 a second waveguide cladding adjacent to the waveguide core.

1 5. The waveguide of claim 1, further comprising:
2 a second waveguide core.

20074057-021402

1 6. A device, comprising:

2 a waveguide having a waveguide core and an air-gap cladding
3 engaging a portion of waveguide core.

1 7. The device of claim 6, wherein the waveguide is included in a microelectronic
2 device.

1 8. The device of claim 6, wherein the waveguide is included in an integrated
2 optical device.

1 9. The device of claim 6, wherein the waveguide is included in a photonic crystal
2 device.

20140217904706070002

1 10. A method for fabricating a waveguide comprising:

2 (a) providing a substrate having a lower cladding layer disposed on the

3 substrate;

4 (b) disposing a waveguide core on a portion of the lower cladding

5 layer;

6 (c) disposing a sacrificial layer onto at least one portion of the lower

7 cladding layer and the waveguide core;

8 (d) disposing an overcoat layer onto the lower cladding layer and the

9 sacrificial layer; and

10 (e) removing the sacrificial layer to define an air-gap cladding layer

11 within the overcoat polymer layer and engaging a portion of the waveguide

12 core.

1 11. The method of claim 10, further including:

2 disposing an optical grating layer adjacent to the waveguide core after

3 (b) and before (c).

1 12. A method for fabricating a device comprising:

2 (a) providing a substrate;

3 (b) disposing a waveguide core on a portion of the substrate;

4 (c) disposing a sacrificial layer onto at least one portion of the substrate

5 and the waveguide core;

6 (d) disposing an overcoat layer onto the substrate and the sacrificial

7 layer; and

8 (e) removing the sacrificial layer to define an air-gap cladding layer

9 within the overcoat polymer layer and engaging a portion of the waveguide

10 core.

40074067.021402

1 13. A system for fabricating a waveguide comprising:

2 (a) means for providing a substrate having a lower cladding layer

3 disposed on the substrate;

4 (b) means for disposing a waveguide core on a portion of the lower

5 cladding layer;

6 (c) means for disposing a sacrificial layer onto at least one portion of

7 the lower cladding layer and the waveguide core;

8 (d) means for disposing an overcoat layer onto the lower cladding layer

9 and the sacrificial layer; and

10 (e) means for removing the sacrificial layer to define an air-gap

11 cladding layer within the overcoat polymer layer and engaging a portion of the

12 waveguide core.